

GRUMMAN AIRCRAFT ENGINEERING CORPORATION
BETHPAGE, L. I., NEW YORK

SECTION XI
ALTITUDE METERS

Ref. Sig.	Figure	
L1	38	Altitude "1"
L2	38	Altitude "0"
L3	38	Altitude Rate "1"
L4	38	Altitude Rate "0"

Pulse Characteristics (See Appendix A for pulse terminology)

Amplitude: 7 ± 3 volts
Width: 3 ± 1 microsecond
Droop: 20%
Backswing: 4 volts
Rise Time: 0.2 microseconds
Repetition Rate: digital data at 3.2 KPPS
Noise Limits:

1. During the "ON" condition, the signal plus noise shall remain within the envelope defined by the parameters specified above.
2. During the "OFF" condition, the noise shall remain within the envelope defined by the upper limit of +0.4V, and the lower limit of -4.0V, measured with respect to the amplitude reference level.

Load and source impedances are specified between "HI" and "LO" with "LO" as reference.

Signals L1 to L4 will not be used in LM-1 due to the deletion of the Display Meter. Each interface will be loaded with a 200 ohm resistor on the CAEC side of the interface.

Altitude Output (Signals L1 and L2): - (See Note 2 below)

1. The signal will be a 16 bit (15 data bits) whole number transfer. The number will be shifted out at a 3.2 KPPS rate on two lines.
2. The first pulse shall always be a "1" and will be a "wake-up" pulse (not data). The next 15 pulses will occur on the "1" or "0" line depending on whether the data in that bit position is a "1" or a "0".
3. High order bits are shifted out first.
4. Quantization: : The least significant bit represents 2.3450 feet.

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5. The range of transmitted altitude will be at least 0 to 60,000 feet.
6. Data will be transmitted at a rate of not less than two data words (2 cycles) per second. (See note 1 below).

Altitude Rate Output (Signals L3 and L4): - See Note 2 below)

1. The signal will be a 16 bit (14 data bits) whole number transfer. The number will be shifted out at a 3.2 KPPS rate on two lines.
2. The first pulse shall always be a "1" and will be a "wake-up" pulse (not data). The second pulse will be a sign pulse (not data). The next 14 pulses will occur on the "1" or "0" lines depending on whether the data in that bit position is a "1" or a "0". The sign will be determined by bit 15 (follows "wake-up" bit). Altitude is increasing (positive opening rates) when the sign bit is a "1". Bits 1-14 represent the magnitude of the number to be displayed.
3. High order bits are shifted out first.
4. Quantization: The least significant bit represents 0.5 feet/second.
5. The range of the transmitted altitude rate will be at least 0 to ± 500 feet/second.
6. Data will be transmitted at a rate of not less than two data words (2 cycles) per second. (See note 1 below)

Note 1: Altitude and Altitude Rate words will be provided simultaneously or on an alternating basis. There will never be two (2) or more consecutive altitude words without an altitude rate word or vice versa.

Note 2: Effectivity:

- (a) LGC Program Luminary (LM-4 and subsequent)
- (b) Prior to LGC Program Luminary, this interface will not be driven.

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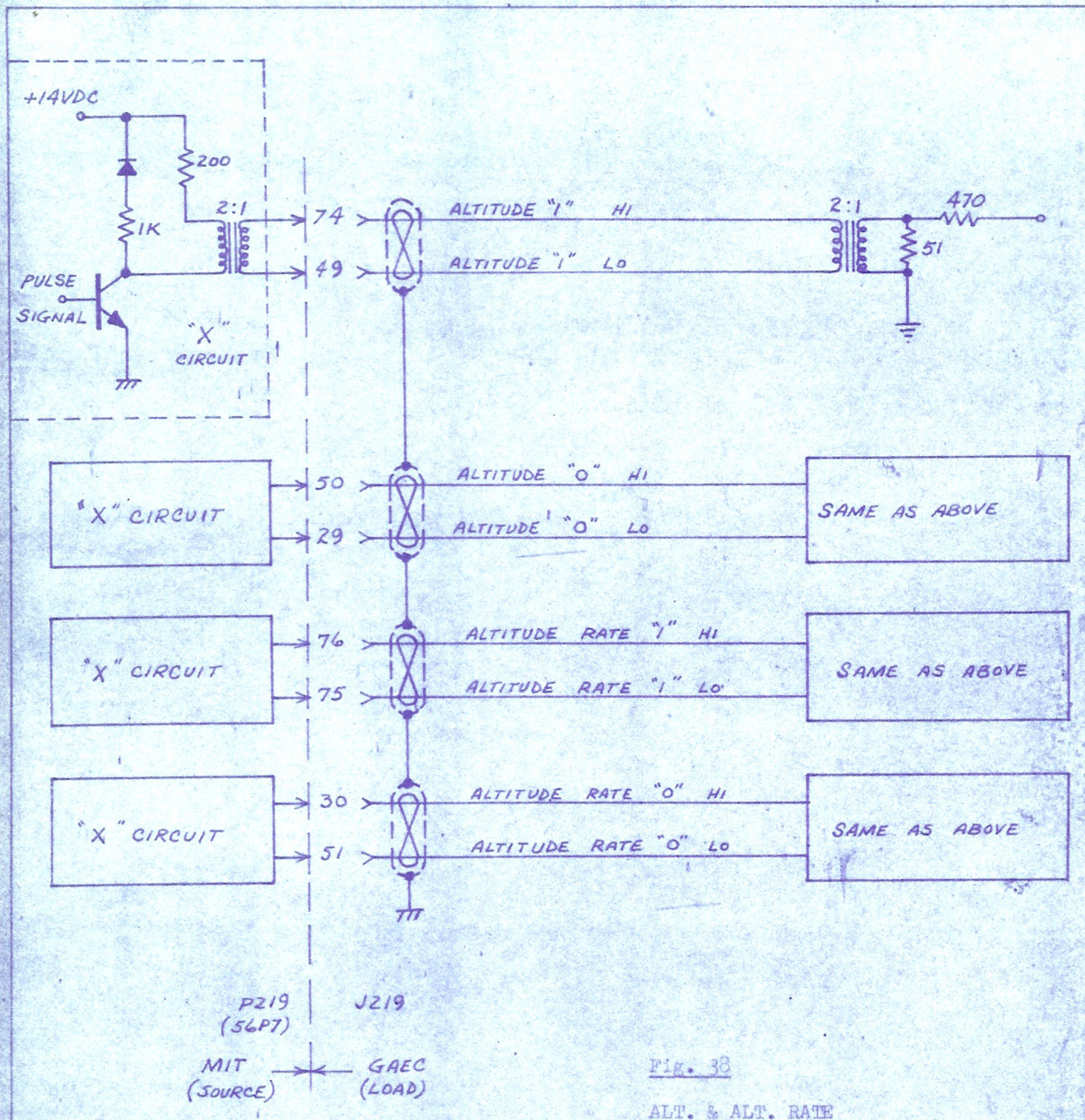


Fig. 38

ALT. & ALT. RATE

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ID	SIGNAL	Z SOURCE OHMS $\pm 10\%$		Z LOAD OHMS $\pm 10\%$		FUNCTIONAL DESCRIPTION
		LOGIC	"1"	"0"	"1"	"0"
L1	Altitude "1"		< 100	< 10 < (10mh)	200	< 20 < (20mh)
L2	Altitude "0"		< 100	< 10 < (10mh)	200	< 20 < (20mh)
L3	Altitude Rate "1"		< 100	< 10 < (10mh)	200	< 20 < (20mh)
L4	Altitude Rate "0"		< 100	< 10 < (10mh)	200	< 20 < (20mh)
Values in parenthesis represent inductance of transformer winding "seen" at interface.						

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